[JP,2000-175188,A]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to improvement of the suitable information storage art especially for copyright protection about the information storage device which records various kinds of information, including a picture, a sound, a program, etc., on recording media, such as DVD and DVC.
[0002]
[Description of the Prior Art]In recent years, the mass digital information signal recording and reproducing system represented by DVD and DVC is commercialized. These digital systems can carry out prolonged record reproduction of a quality sound and high-definition image as compared with the conventional analogue system. Information, including an image, music, etc., is expressed as a digital signal. For this reason, as compared with the case where it expresses with an analog signal, when a signal is copied (duplicate), there is the feature on transmission that there is no degradation of information. Since it is such, it has been a big problem on copyright protection, and the digital copy which copies a digital signal in the form of a digital signal as it is is forbidden, or fixed restriction is added.
[0003]It is expected that it becomes the tendency for the contents by which the digital recording was carried out to increase like digital broadcasting, such as CS, or DVD-MOVIE especially in recent years, and this tendency becomes future still more remarkable. It is expected in the future that high digital contents of quality like land-based digital broadcasting or digital HDTV and also appear. Considering such a viewpoint, solution of the problem on the copyright which a digital copy has is desired.
[0004]SCMS (serial copy management system) adopted by the signal recording method of MD is one of those were proposed from such a point. In this SCMS, the protection code (protection code) about the propriety of a copy is contained at a part of digital signal. And when an MD device copies a signal, it is a system which is going to prevent two digital copies or more by referring to this protection code. Specifically, the protection code is written in the data of the TOC (total OBU contents) field of MD.If this protection code is "with no protection", the signal of that MD can be copied. If a copy is performed, a protection code "with protection" will be shortly written in the TOC area of MD of a copy destination. If a protection code is "with protection", it cannot copy henceforth. Thus, two digital copies or more are prevented.
[0005]
[Problem(s) to be Solved by the Invention]However, there is the following inconvenience in the above conventional technologies.
(1) a method like above-mentioned SCMS -- a copy impossibility and 1 time -- the copy possibility of and a copy -- only three unrestricted possible kinds can be set up and it cannot be said to be what may not necessarily be satisfied about the point of corresponding flexibly to the needs of digital contents and the user who are diversified.
(2) When beginning to read the information currently recorded on MD with a direct record signal and recording this on other media, it will be copied the whole protection code regardless of the contents of the protection code. For this reason, any number of times, a copy becomes possible and an unjust copy cannot be prevented on copyright.

[0006]This invention is what noted the above point, can respond to the security level of the digital contents to diversify flexibly, and sets it as the purpose to provide information storage art effective in copyright protection.
[0007]
[Means for Solving the Problem]In an information storage device which this invention carries out coding with a variable transfer rate to an input signal, and is recorded on a recording medium in order to attain said purpose, A security level determination means to judge the security level according to sauce of said input signal; it had encode means; which codes said input signal with a transfer rate corresponding to a security level determined by this. A sauce judging means said security level determination means judges sauce of said input signal to be according to one of the main gestalten; according to a decision result by this, security level judging means; which judges a security level is included.
[0008]
[Embodiment of the Invention]Hereafter, an embodiment of the invention is described in detail, referring to drawings. Drawing 1 is a block diagram showing the composition of one embodiment of this invention. In drawing 1, the digital input signal 10 and the analog input signal 12 are inputted into the sauce judging device 14. The output side of the sauce judging device 14 is connected to the security level judging device 16. The output side of the security level judging device 16 is connected to the 2nd encoder 20 via the 1st encoder 18. The output side of this 2nd encoder 20 is connected to the recording head 24 via the recording head driving circuit 22. A signal is recorded on the recording medium 26 by this recording head 24.
[0009]Next, explanation of the whole operation will input the signal of a recording object into the sauce judging device 14. The sauce of an input signal is judged in the sauce judging device 14. That is, an analog signal or a digital signal is first judged for an input signal. When an input signal is a digital signal, it is judged what kind of digital signal the signal is. As a kind of digital signal, there are DV signal from a digital camcorder, a signal of CS digital broadcasting, an MPEG 2 signal from DVD video, etc., for example. In the future, BS, the signal of terrestrial digital broadcasting, etc. are considered. It is judged from the code and signal with which whether it is which kind of these shows sauce.
[0010]The security level on copyright is determined by the kind of input signal judged by the sauce judging device 14 in the security level judging device 16. A signal transfer rate when recording an input signal on a recording medium is determined by this security level. The quality of the signal recorded by the transfer rate at the time of record is influenced greatly. The quality of the original signal and the copied signal is equivalent, without a signal quality falling off, if it is the same recording transfer rate as the time of an input. However, if a recording transfer rate is made lower than the time of an input, as a signal quality deteriorates and makes a transfer rate low, the quality difference with the original signal will become larger.
[0011]Next, coding of a signal is performed in the 1st encoder 18 by the transfer rate determined by the security level judging device 16. In the 2nd encoder 20, an address, an error correcting code, etc. are added to the signal coded by the 1st encoder 18 according to the format of the medium recorded. In the recording head driving circuit 22, the signal after encoding is changed into a lightwave signal or a magnetic signal, and is supplied to the recording head 24. In the recording head 24, record of data is performed to the recording medium 26 based on an input signal.
[0012]Next, the relation of the transfer rate of the input signal judging by the sauce judging device 14, the judgment by the security level judging device 16, and the coding by the 1st

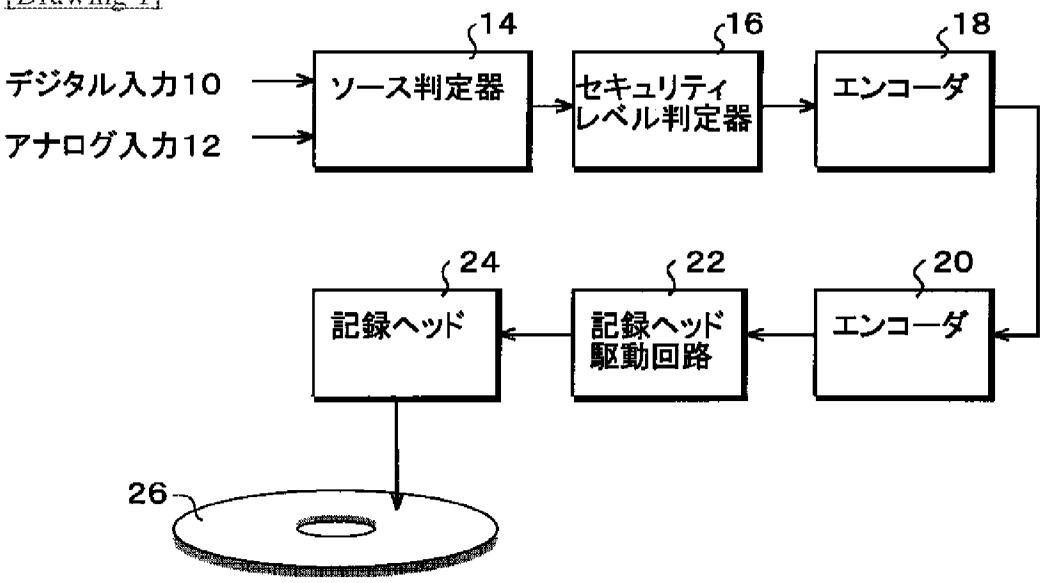
encoder 18 is explained concretely, referring to drawing 2. In the example of this drawing 2, an input signal is first distinguished by two, an analog signal and a digital signal. And in the case of an analog signal, a security level is judged to be "0." In this case, the dynamic image signal or audio signal which is an input signal is coded with the transfer rate of the value beforehand set up as a default.
[0013]On the other hand, in the case of a digital signal, a security level is further divided into plurality by the contents of information, old and new [of an exhibition stage], etc., for example. The digital signal is divided into four steps of levels in the example of the graphic display. First, in digital signal A which is the security level 1, a dynamic image signal or an audio signal is coded with the same transfer rate as the original signal. In this case, the quality of the original signal is the same as the quality of the signal recorded on the recording medium 26. For example, the copyright-free image etc. which were photoed with the home digital camcorder etc. correspond to this security level 1.
[0014]Next, in digital signal B which is the security level 2, a dynamic image signal or an audio signal is coded with 2/3 of the transfer rates of the transfer rate of the original signal, and it is recorded. In this case, the quality of the signal recorded on the recording medium 26 will deteriorate a little from the quality of the original signal. This level 2 is applied when saying that the contents offer side does not want to copy a certain amount of copy while it has been the original quality, although accepted.
[0015]Next, in digital signal C which is the security level 3, a dynamic image signal or an audio signal is coded with 1/2 of the transfer rates of the transfer rate of the original signal, and it is recorded. In this case, the quality of the signal recorded on the recording medium 26 deteriorates further as compared with the quality of the original signal, and is lower than digital signal B of the security level 2. It is applied when saying that he does not want to carry out a copy while it has been the original quality, although the contents offer side accepts a certain amount of copy also in this case.
[0016]Next, since the record of the case of digital signal D which is the security level 4 itself is made improper, coding is not performed. This is applied when saying that the contents offer side does not accept a copy. Thereby, an illegal copy is prevented.
[0017]Next, other embodiments are described, referring to drawing 3. In this gestalt, an input signal is supplied to the encoder 18, without performing the judgment by the security level judging device 32, when judged with it being an analog signal, for example in the sauce judging device 30. As shown in drawing 2, in the case of an analog signal, a security level is "0", and a transfer rate is a default value. Therefore, it is not necessary to judge a security level.
[0018]
[Effect of the Invention]According to this invention, the following effects are acquired as explained above.
** Since we decided to judge the security level of the target contents when coding a signal, the problem of copyright is also solvable, making a copy possible. It is not coding depending on a security level, and an unjust copy can be prevented.
** According to a security level since the transfer rate of a copy is changed, construction of the recording system which can satisfy the contents offer side and a user's needs flexibly is attained.

[Claim(s)]
[Claim 1]In an information storage device which carries out coding with a variable transfer rate to an input signal, and is recorded on a recording medium, A security level determination means

to judge the security level according to sauce of said input signal; an information storage device having encode means; which codes said input signal with a transfer rate corresponding to a security level determined by this.
[Claim 2]A sauce judging means said security level determination means judges sauce of said input signal to be; the information storage device according to claim 1 by which security level judging means; which judges a security level being included according to a decision result by this.

DRAWINGS

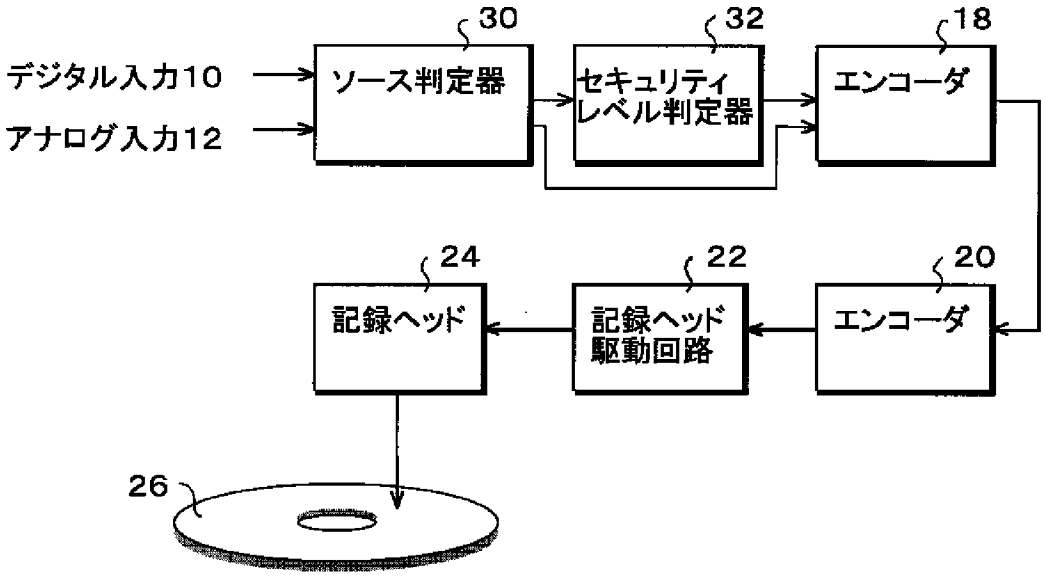
[Drawing 1]



[Drawing 2]

入力信号	セキュリティレベル	記録転送レート
アナログ信号	0	Default
デジタル信号A	1	Original
デジタル信号B	2	2／3
デジタル信号C	3	1／2
デジタル信号D	4	記録不可

[Drawing 3]



[Translation done.]